

Skills Worksheet

Science Skills**Interpreting Timelines**

The timeline below shows some of the physical events that have helped to shape life on Earth. Some major advances in the evolution of life are also shown. Use the timeline and the “Life Events” (a–d) listed below the timeline to complete items 1–4.

In each numbered space in the timeline, write the letter of the most appropriate event from the “Life Events” below the timeline.

Timeline of Life on Earth

Number of years ago	Life events	Physical events
4.5 billion		Earth forms and surface cools.
2.5 billion	1. _____	Oxygen gas is released into seas, then enters atmosphere.
1.5 billion	The first eukaryotes evolve.	
700 million	The first multicellular organisms evolve.	
440 million	First mass extinction	
430 million	2. _____	Protective ozone shield in place in upper atmosphere
370 million	Amphibians are the first vertebrates on land.	
360 million	Second mass extinction	
350 million	3. _____	Widespread drought
245 million	Third mass extinction	
210 million	Fourth mass extinction	
65 million	Fifth mass extinction	
60 million	4. _____	Earth’s climate becomes moist.
2 million	The first humans appear.	
Present	More than half of tropical rain forests and many species destroyed	

Life Events

- a.** Reptiles evolve from amphibians and become dominant on land.
- b.** Birds and mammals become dominant on land.
- c.** Plants and fungi invade land for the first time.
- d.** Cyanobacteria first begin to carry out photosynthesis.

Science Skills *continued*

Use the timeline on the previous page to answer questions 5–9.

Read each question, and write your answer in the space provided.

- 5.** Name an organism that is seriously damaging Earth’s ecosystems, and describe some of the damage being caused by this organism.

- 6.** What are some factors that have caused the dominant life-forms on Earth to change over time?

- 7.** Is another major mass extinction likely? Explain.

- 8.** What environmental changes affected the evolution of reptiles?

- 9.** What effect did photosynthetic cyanobacteria have on Earth’s environment?

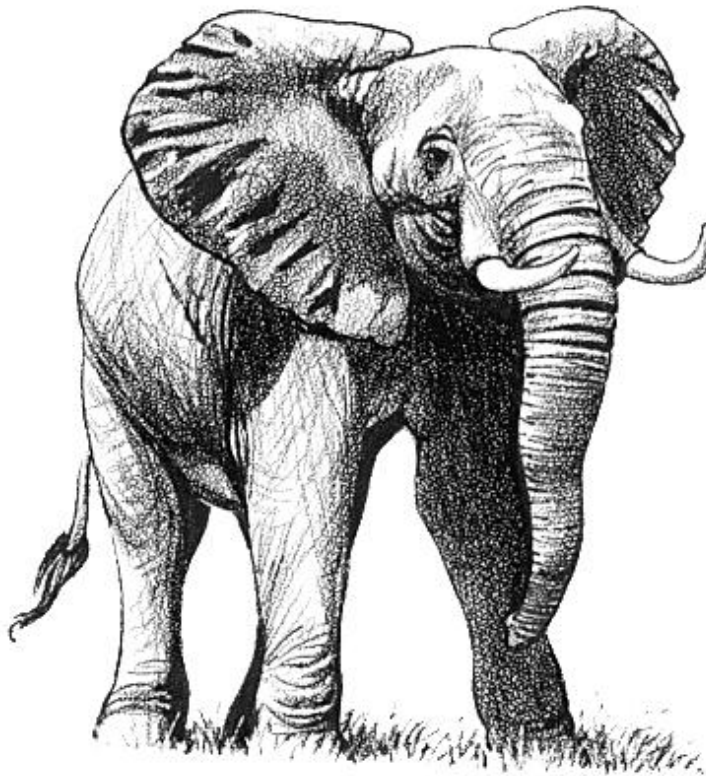
Science Skills

APPLYING INFORMATION

Darwin stated that evolution occurs through natural selection. The key factor is the environment. The environment “selects” which organisms will survive and reproduce. Traits possessed by organisms successful at survival and reproduction are more likely to be transmitted to the next generation. These traits will, therefore, become common.

Read the following information about the elephant population of Queen Elizabeth National Park in Uganda, Africa. Then use the table on the next page to answer questions 1–5.

Normally, nearly all African elephants, male and female, have tusks. In 1930, only 1 percent of the elephant population in Queen Elizabeth National Park was tuskless because of a rare genetic mutation. Food was fairly plentiful, and by 1963, there were 3,500 elephants in the park. In the 1970s, a civil war began in Uganda. Much of the wildlife was killed for food, and poachers killed elephants for their ivory tusks. By 1992, the elephant population had dropped to about 200. But by 1998, the population had increased to 1,200. A survey in 1998 revealed that as many as 30 percent of the adult elephants did not have tusks. Ugandan wildlife officials also noted a decline in poaching.



Science Skills *continued*

In the space provided in the table below, explain how each of the given principles of natural selection applies to the situation described on the previous page.

The Process of Natural Selection

Principles	Applications
All species have genetic variation.	1. _____ _____ _____
Living things face many challenges in the struggle to exist.	2. _____ _____ _____
Individuals of species often compete with one another to survive.	3. _____ _____ _____
Individuals that are better able to cope with the challenges of their environment tend to leave more offspring than those less suited.	4. _____ _____ _____
The characteristics of the individuals best suited to a particular environment tend to increase in a population over time.	5. _____ _____ _____